

What is claimed is:

1. A transgenic plant, which plant comprises a recombinant polynucleotide comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a polypeptide comprising a sequence selected from SEQ ID

5 Nos. 2N, where N=1-4, or a complementary nucleotide sequence thereof;

(b) a nucleotide sequence encoding a polypeptide comprising a conservatively substituted variant of a polypeptide of (a);

(c) a nucleotide sequence comprising a sequence selected from those of SEQ ID Nos. 2N-1, where N=1-4, or a complementary nucleotide sequence thereof;

10 (d) a nucleotide sequence comprising silent substitutions in a nucleotide sequence of (c);

(e) a nucleotide sequence which hybridizes under stringent conditions to a nucleotide sequence of one or more of: (a), (b), (c), or (d);

(f) a nucleotide sequence comprising at least 15 consecutive nucleotides of a sequence of any of (a)-(e);

15 (g) a nucleotide sequence comprising a subsequence or fragment of any of (a)-(f), which subsequence or fragment encodes a polypeptide that modifies a plant's biomass;

(h) a nucleotide sequence having at least 40% sequence identity to a nucleotide sequence of any of (a)-(g);

(i) a nucleotide sequence having at least 85% sequence identity to a nucleotide sequence of any of

20 (a)-(g);

(j) a nucleotide sequence which encodes a polypeptide having at least 40% sequence identity to a polypeptide of SEQ ID Nos. 2N, where N=1-4;

(k) a nucleotide sequence which encodes a polypeptide having at least 85% sequence identity to a polypeptide of SEQ ID Nos. 2N, where N=1-4; and

25 (l) a nucleotide sequence which encodes a polypeptide having at least 65% sequence identity to a conserved domain of a polypeptide of SEQ ID Nos. 2N, where N=1-4.

2. The transgenic plant of claim 1, further comprising a constitutive, inducible, or tissue-active promoter operably linked to said nucleotide sequence.

30

3. An isolated or recombinant polynucleotide comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a polypeptide comprising a sequence selected from SEQ ID Nos. 2N, where N=1-4, or a complementary nucleotide sequence thereof;

(b) a nucleotide sequence encoding a polypeptide comprising a conservatively substituted variant of a polypeptide of (a);

(c) a nucleotide sequence comprising a sequence selected from those of SEQ ID Nos. 2N-1, where N=1-4, or a complementary nucleotide sequence thereof;

5 (d) a nucleotide sequence comprising silent substitutions in a nucleotide sequence of (c);

(e) a nucleotide sequence which hybridizes under stringent conditions to a nucleotide sequence of one or more of: (a), (b), (c), or (d);

(f) a nucleotide sequence comprising at least 15 consecutive nucleotides of a sequence of any of (a)-(e);

10 (g) a nucleotide sequence comprising a subsequence or fragment of any of (a)-(f), which subsequence or fragment encodes a polypeptide having a biological activity that modifies a plant's biomass;

(h) a nucleotide sequence having at least 40% sequence identity to a nucleotide sequence of any of (a)-(g);

15 (i) a nucleotide sequence having at least 85% sequence identity to a nucleotide sequence of any of (a)-(g);

(j) a nucleotide sequence which encodes a polypeptide having at least 40% sequence identity to a polypeptide of SEQ ID Nos. 2N, where N=1-4;

(k) a nucleotide sequence which encodes a polypeptide having at least 85% sequence identity to a polypeptide of SEQ ID Nos. 2N, where N=1-4; and

20 (l) a nucleotide sequence which encodes a conserved domain of a polypeptide having at least 65% sequence identity to a conserved domain of a polypeptide of SEQ ID Nos. 2N, where N=1-4.

4. The isolated or recombinant polynucleotide of claim 3, further comprising a constitutive, inducible, or tissue-active promoter operably linked to the nucleotide sequence.

25 5. A cloning or expression vector comprising the isolated or recombinant polynucleotide of claim 3.

30 6. A cell comprising the cloning or expression vector of claim 5.

7. An isolated or recombinant polypeptide comprising a subsequence of at least about 15 contiguous amino acids encoded by the recombinant or isolated polynucleotide of claim 3.

8. The isolated or recombinant polypeptide of claim 7 comprising a sequence selected from those of SEQ ID Nos. 2N, where N=1-4, or a sequence comprising a conservative substitution therein.

5 9. A method for producing a plant having a modified biomass, the method comprising altering the expression of the isolated or recombinant polynucleotide of claim 3 or the expression levels or activity of a polypeptide of claim 7 in a plant, thereby producing a modified plant, and selecting the modified plant for an improved plant biomass.

10 10. A method of identifying a factor that is modulated by or interacts with a polypeptide encoded by a polynucleotide of claim 3, the method comprising:
(a) expressing a polypeptide encoded by the polynucleotide in a plant; and
(b) identifying at least one factor that is modulated by or interacts with the polypeptide.

15 11. The method of claim 10, wherein the identifying is performed by detecting binding by the polypeptide to a promoter sequence, or detecting interactions between an additional protein and the polypeptide in a yeast two hybrid system.

12. The method of claim 10, wherein the identifying is performed by detecting expression of a factor by hybridization to a microarray, subtractive hybridization or differential display.

20 13. A method of identifying a molecule that modulates activity or expression of a polynucleotide or polypeptide of interest, the method comprising:
(a) placing the molecule in contact with a plant comprising the polynucleotide or polypeptide encoded by the polynucleotide of claim 3; and,
(b) monitoring one or more of: (i) expression level of the polynucleotide in the plant;
(ii) expression level of the polypeptide in the plant; (iii) modulation of an activity of the polypeptide in the plant; or (iv) modulation of an activity of the polynucleotide in the plant.

25 14. A method of identifying a sequence similar or homologous to one or more polynucleotides of claim 3, or one or more polypeptides encoded by the polynucleotides, the method comprising:
(a) providing a sequence database; and,

(b) querying the sequence database with one or more target sequences corresponding to the one or more polynucleotides or to the one or more polypeptides to identify one or more sequence members of the database that display sequence similarity or homology to one or more of the one or more target sequences.

5

15. The method of claim 14, wherein the querying comprises aligning one or more of the target sequences with one or more of the one or more sequence members in the sequence database.

10 16. The method of claim 14, further comprising linking the one or more of the polynucleotides of claim 3, or encoded polypeptides, to a modified plant biomass.

17. A plant comprising altered expression levels of the isolated or recombinant polynucleotide of claim 3.

15

18. A plant comprising altered expression levels or the activity of the isolated or recombinant polypeptide of claim 7.